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EXAMINER	
CUTLER, ALBERT H	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/664,487	KIM, DONG-HEE	
	Examiner	Art Unit	
	Albert H. Cutler	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *7 May 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. DETAILED ACTION

2. This office action is responsive to communication filed on May 7, 2007. Claims 1-20 are pending in the application.

Response to Arguments

3. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-3, 8, 9, 11, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suso et al.(US 6,069,648) in view of Tseng et al.(US 5,815,759).

Consider claim 1, Suso et al. teach:

A mobile communication terminal(figures 1a-9, column 2, line 49 through column 10, line 5) with an integrated camera("housing member", 8, figures 1a and 2, "In the housing member(8), a thin video camera, a circuit board on which a circuit for processing an output of the video camera is mounted, and the like are housed" column 2, lines 5-8) , the mobile communication terminal(see figure 2) comprising:

a body(see figure 2, the body is in the form of a mobile telephone.);

at least one manipulation device disposed on the body that performs an operational function of the camera("recording button", 19f, figure 7, The recording button starts and stops the recording of the camera, column 5, lines 31-32. The recording button is on the operation part(19) of the display(4) of the upper case(1), column 5, lines 20-32.);

and a display for reproducing an image created by the camera("display part", 18, figure 7. "An image photographed by the video camera housed in the housing member(8) is displayed on the display part(18)", column 5, lines 22-24.), wherein the camera(8) is mounted on the body of the mobile communication terminal(see figure 2) so that orientation of the camera(8) can be manipulated("The housing member(i.e. camera), 8, is rotatably attached(i.e. the camera can be rotated in order to change the orientation) to the rotary shaft supporting part 6" column 3, lines 3-5).

However, Suso et al. do not explicitly teach that the camera has a first and a second degree of movement relative to the manipulation device.

Tseng et al. is similar to Suso et al. in that Tseng et al. teach of an integrated camera(63, figure 6) attached to a manipulation device(62, figure 6) which is rotatably

coupled to a base(61). Tseng is further similar in that the camera module(63) is rotatably coupled via a shaft(64) to the manipulation device(see figure 6, column 4, line 65 through column 5, line 24). Furthermore, Tseng et al. disclose in the prior art(figure 2, column 1, lines 32-44) an integrated camera module(21) with a single degree of rotation, similar to that taught by Suso et al.

However, in addition to the teachings of Suso et al., Tseng et al. teach that the camera(63, figure 6) has a first and a second degree of movement relative to the manipulation device(See figure 6. The camera(63) is connected to the shaft(64) via a ball joint which allows it to move about multiple degrees of freedom(column 3, lines 50-54, column 4, line 65 through column 5, line 24). Because the ball joint taught by Tseng et al. is within the camera module(63), it is possible that a ball joint can be implemented within the camera module(8) taught by Suso et al., with the ball inside the camera module(8) and connected to the shaft(8a).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to include a ball join within the camera module taught by Suso et al. so that the camera can rotate about multiple degrees of freedom as taught by Tseng et al. for the benefit of expanding the operational versatility of the imaging system by making it more convenient and easier to use in working areas with limited space or where the imaging object is obscure in viewing(Tseng et al., column 1, lines 14-44).

Consider claim 2, and as applied to claim 1 above, Suso et al. further teach:

the terminal(see figure 2) is a folding type mobile communication terminal(figure 4, column 4, lines 11-22) and further comprises:

a lower main folder("lower case", 2, see figure 1a, column 2, line 54);

an upper subfolder("upper case", 1, see figure 1a, column 2, line 54);

a hinge connection element("rotary shaft supporting part", 6, see figure 2) that pivotally connects("The housing member(8) is rotatably attached to(i.e. pivotally connected to) the rotary shaft supporting part(6) from the opposite side of the rotary shaft(7)", column 3, lines 3-5) the lower main folder(2) to the upper subfolder(1)(Rotary shaft(7) is connected to the upper subfolder(1), and rotary shaft supporting part(6) is connected to the lower main folder(2) as shown in figure 2, so that the mobile telephone can pivot as shown in figure 4.), wherein the hinge connection element(6) has a first side(left side, see figure 2) laterally opposite to a second side(right side, see figure 2);

an adjustment plate("rotary shaft", 7) disposed on the first side(left side, see figure 2) of the hinge connection element(6), wherein manipulation of the adjustment plate(7) results in a change in orientation of the camera(column 3, lines 32-36, The cases(1 and 2) can be opened and closed with adjustment plate(7) and the camera rotates with respect to the rotary shaft supporting part(6).);

and the camera(8) disposed on the second side(right side, see figure 2) of the hinge connection element(6).

Consider claim 3, and as applied to claim 2 above, Suso et al. further teach:

at least one shaft(small diameter parts(7a and 8a) are rotatably fit into each other to form a shaft, column 3, lines 32-35, see figure 2) axially disposed in the hinge connection element(8) and having first(7a) and second ends(8a) connected to the adjustment plate(7) and the camera(8), respectively(see figure 2, column 3, lines 27-32).

Consider claim 11, and as applied to claim 1 above, Suso et al. further teaches:

the terminal(see figure 2) is a folding type mobile communication terminal(figure 4, column 4, lines 11-22) and further comprises:

a lower main folder("lower case", 2, see figure 1a, column 2, line 54);

an upper subfolder("upper case", 1, see figure 1a, column 2, line 54);

a tubular hinge connection element("rotary shaft supporting part", 6, see figure 2) that pivotally connects("The housing member(8) is rotatably attached to(i.e. pivotally connected to) the rotary shaft supporting part(6) from the opposite side of the rotary shaft(7)", column 3, lines 3-5) the lower main folder(2) to the upper subfolder(1)(Rotary shaft(7) is connected to the upper subfolder(1), and rotary shaft supporting part(6) is connected to the lower main folder(2) as shown in figure 2, so that the mobile telephone can pivot as shown in figure 4.), wherein the tubular hinge connection element(6) comprises a first side(left side, see figure 2) laterally opposite to a second side(right side, see figure 2);

a cylindrical pivot member(Small diameter parts(7a and 8a)) inserted into the tubular hinge connection element(6, see figure 2);

an adjustment plate disposed("rotary shaft", 7) on the first side(left side, see figure 2) of the tubular hinge element(6), wherein manipulation of the adjustment plate(7) results in a change in orientation of the camera(column 3, lines 32-36, The cases(1 and 2) can be opened and closed with adjustment plate(7) and the camera rotates with respect to the rotary shaft supporting part(6).);

and the camera(8) disposed on the second side(right side, see figure 2) of the tubular hinge connection element(6).

However, Suso et al. do not explicitly teach that the camera has a first and a second degree of movement relative to the tubular hinge connection element, or that at least one shaft connecting the camera and adjustment plate is axially displaced.

However, in addition to the teachings of Suso et al., Tseng et al. teach that the camera(63, figure 6) has a first and a second degree of movement relative to a manipulation device(See figure 6. The camera(63) is connected to the shaft(64) via a ball joint which allows it to move about multiple degrees of freedom(column 3, lines 50-54, column 4, line 65 through column 5, line 24). Because the ball joint taught by Tseng et al. is within the camera module(63), it is possible that a ball joint can be implemented within the camera module(8) taught by Suso et al., with the ball inside the camera module(8) and connected to the shaft(8a). The ball joint would allow the camera to have a first and second degree of movement relative to the tubular hinge element.

Consider claim 8, and as applied to claim 2 above, Suso et al. and Tseng et al. do not explicitly teach that the adjustment plate(7) comprises a rigid polymer.

However, **Official Notice** (MPEP § 2144.03) is taken that both the concepts and the advantages of using a rigid polymer to construct a manual device such as an adjustment plate of a mobile terminal are well known and expected in the art.

Therefore, a person having ordinary skill in the art at the time of the invention would have been motivated to have the adjustment plate taught by Suso et al. comprise a rigid polymer because rigid polymers can be made through plastic injection molding, which is very cost efficient due to the fact that many parts can be made simultaneously (using the same mold), yet still produces a durable product.

It should be noted that the common knowledge for using a rigid polymer to construct a manual device such as an adjustment plate of a mobile terminal **is taken as admitted prior art** because Applicant failed to seasonably traverse this common knowledge from the amendment filed on May 7, 2007. See MPEP § 2144.03. In re Chevenard, 60 USPQ 239 (CCPA 1943).

Consider claim 9, and as applied to claim 2 above, Suso et al. and Tseng et al. do not explicitly teach that the adjustment plate(7) comprises a flexible rubber.

However, **Official Notice** (MPEP § 2144.03) is taken that both the concepts and the advantages of using a flexible rubber to construct a manual device such as an adjustment plate of a mobile terminal are well known and expected in the art.

Therefore, a person having ordinary skill in the art at the time of the invention would have been motivated to have the adjustment plate taught by Suso et al. comprise a flexible rubber because rubber is very useful in dampening blows from interlocking

equipment and creating seals that protect internal components, as well as being durable due to its elasticity.

It should be noted that the common knowledge for using a flexible rubber to construct a manual device such as an adjustment plate of a mobile terminal **is taken as admitted prior art** because Applicant failed to seasonably traverse this common knowledge from the amendment filed on May 7, 2007. See MPEP § 2144.03. In re Chevenard, 60 USPQ 239 (CCPA 1943).

Consider claim 18, and as applied to claim 11 above, Suso et al. and Tseng et al. do not explicitly teach that the adjustment plate(7) comprises a rigid polymer.

However, **Official Notice** (MPEP § 2144.03) is taken that both the concepts and the advantages of using a rigid polymer to construct a manual device such as an adjustment plate of a mobile terminal are well known and expected in the art.

Therefore, a person having ordinary skill in the art at the time of the invention would have been motivated to have the adjustment plate taught by Suso et al. comprise a rigid polymer because rigid polymers can be made through plastic injection molding, which is very cost efficient due to the fact that many parts can be made simultaneously (using the same mold), yet still produces a durable product.

It should be noted that the common knowledge for using a rigid polymer to construct a manual device such as an adjustment plate of a mobile terminal **is taken as admitted prior art** because Applicant failed to seasonably traverse this common

knowledge from the amendment filed on May 7, 2007. See MPEP § 2144.03. In re Chevenard, 60 USPQ 239 (CCPA 1943).

Consider claim 19, and as applied to claim 11 above, Suso et al. and Tseng et al. do not explicitly teach that the adjustment plate(7) comprises a flexible rubber.

However, **Official Notice** (MPEP § 2144.03) is taken that both the concepts and the advantages of using a flexible rubber to construct a manual device such as an adjustment plate of a mobile terminal are well known and expected in the art.

Therefore, a person having ordinary skill in the art at the time of the invention would have been motivated to have the adjustment plate taught by Suso et al. comprise a flexible rubber because rubber is very useful in dampening blows from interlocking equipment and creating seals that protect internal components, as well as being durable due to its elasticity.

It should be noted that the common knowledge for using a flexible rubber to construct a manual device such as an adjustment plate of a mobile terminal **is taken as admitted prior art** because Applicant failed to seasonably traverse this common knowledge from the amendment filed on May 7, 2007. See MPEP § 2144.03. In re Chevenard, 60 USPQ 239 (CCPA 1943).

1. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Suso et al.(US Patent 6,069,648) in view of Tseng et al.(US 5,815,759) as applied to claim 3

above, further in view of Karube et al.(US Patent Application Publication 2001/0050711).

Consider claim 4, and as applied to claim 3 above, Suso et al. teach of first and second ends of a shaft connecting an adjustment plate and a camera(see claim 3 rationale).

The combination of Suso et al. and Tseng et al. does not explicitly teach that one of the ends of the shaft is connected via a universal joint element.

Karube et al. teach of a video camera unit with a free head(figures 7-9, paragraphs 0099-0106). Like Suso et al., Karube et al. teach that the camera is connected to a body(paragraphs 0100-0103), whether that body be a PC Card, a Personal Computer, or a Personal Digital assistant, as shown in figures 7-9, respectively. The video camera unit(2), which would correspond to camera(8) of Suso et al., is connected to said bodies via a holder(3) as shown in figures 7-9.

However, in addition to the teachings of Suso et al., Karube et al. teaches that the camera is connected via a holder(3) that consists of a universal joint element. This universal joint element is detailed in figure 11, and in paragraphs 110-117. In the device of Suso et al., the second end(i.e. right end) of right portion of the shaft(8a) could be connected to the camera(8) via the universal joint element taught by Karube et al. The left side of shaft(8a) would still be connected to shaft(7a) and the adjustment plate(7).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to use the universal joint element taught by Karube et al., in place of the ball joint taught by the combination of Suso et al. and Tseng et al., because the universal joint element provides the benefit of being able to adjust the viewing angle of the camera manually, and in a simple fashion with the use of one's finger, and thus being able to achieve an optimal viewing angle regardless of the original position of the camera in relation to the subject being photographed(Karube et al., paragraphs 0106 and 0117).

2. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suso et al.(US Patent 6,069,648) in view of Tseng et al.(5, 815,759) in view of Karube et al.(US Patent Application Publication 2001/0050711) as applied to claim 4 above, and further in view of Kohno et al.(US Patent 5,993,101).

Consider claim 5, and as applied to claim 4 above, Suso et al. teach of a shaft(small diameter parts(7a and 8a) are rotatably fit into each other to form a shaft, column 3, lines 32-35, see figure 2, see claim 3 rationale). Suso et al. also teach that the shaft is disposed approximately centrally within the hinge connection element(6)(see figure 2, the center of the shaft formed by 7a and 8a is concentric with the center of the hinge connection element(6)). Furthermore, Suso et al. teach of first and second shaft openings through which the shaft(7a and 8a) travels(see figure 2, the hinge connection

element(6) has a first opening(i.e. left side) through which left shaft portion(7a) travels, and a second opening(i.e. right side) through which right shaft portion(8a) travels.)

However, the combination of Suso et al. Tseng et al., and Karube et al. does not explicitly teach of a right shaft, a left shaft, an upper shaft, and a lower shaft axially disposed in the hinge connection element;

wherein the right, left, upper and lower shafts are approximately symmetrically disposed around the central shaft;

wherein the central, right, left, upper and lower shafts travel through the first and second openings and are connected to the adjustment plate and camera, respectively.

Kohno et al. teach of a shaft coupling method(column 4, line 16, through column 6, line 21). Like Suso et al., Kohno et al. teach coupling photosensitive units(column 3, lines 48-54). Also like Suso et al., Kohno et al. teach of using a central shaft(33, figure 3), that travels within an opening(see figure 6, the central shaft(33) is inserted into the opening(35c), column 5, lines 54-56). Kohno et al. illustrate that a new coupling device is needed because current devices contain complicated coupling structures, and cannot cope with shafts whose axes are not in parallel(column 2, lines 15-26). Therefore, Kohno et al. propose a more efficient coupling structure.

In addition to the teachings of Suso et al. and Karube et al., Kohno et al. teach a right shaft, a left shaft, an upper shaft, and a lower shaft axially disposed in the hinge connection element(see figure 3, there are four shafts(36b) axially disposed from central shaft(33));

wherein the right, left, upper and lower shafts are approximately symmetrically disposed around the central shaft(33)("four connecting pins which are arranged along the same circumference at equal pitch" column 5, lines 29-34, see figure 3);

The shaft coupling structure taught by Kohno et al., and illustrated above, would replace the shaft coupling structure taught by Suso et al., and shown in figure 2 of Suso et al. Basically, 7a and 8a of Suso et al. would be replaced by the 5-pin shaft configuration taught by Kohno et al. The combined invention of Suso et al., Karube et al., and Kohno et al. would then produce a device in which the central, right, left, upper and lower shafts(taught by Kohno et al.) travel through the first(Suso et al., left side of(6)) and second(Suso et al., right side of(6)) openings and are connected to the adjustment plate(7) and camera(8), respectively.

It would have been obvious to a person having ordinary skill in the art at the time of the invention to couple the adjustment plate and camera as taught by the combination of Suso et al., Tseng et al., and Karube et al. by using the 5-pin shaft configuration as taught by Kohno et al. for the benefit of producing a coupling device which is still simple in structure, yet capable of coping with a misalignment between the axes of the camera and adjustment plate, such misalignment as is caused by dimensional tolerances in the manufacturing stage(Kohno et al., column 3, lines 10-18).

Consider claim 6, and as applied to claim 5 above, Suso et al. teach of first and second openings(see claim 5 rationale). However, the combined invention of Suso et

al., Tseng et al., and Karube et al. does not explicitly teach that the first and second openings are cruciform in shape.

Kohno et al. teach that the first and second openings are cruciform in shape(Kohno et al., see figure 5, the recess that the 5-pin shaft shown in figure 3 is coupled to is cruciform in shape. Because both the camera and the adjustment plate would be coupled to this, both openings would have to be cruciform in shape.).

Consider claim 7, and as applied to claim 5 above, the combined invention of Suso et al., Tseng et al., and Karube et al. does not explicitly teach that a first and second stoppers are disposed on the first and second ends of the central shaft, respectively, adjacent to the first and second ends of the hinge connection element.

However, Kohno et al. teach a first and second stoppers("a C-ring which functions as a stopper", 41, figure 4, column 5, lines 39-42) are disposed on the first and second ends(i.e. left and right ends) of the central shaft(33), respectively, adjacent to the first and second ends of the hinge connection element(The stoppers(41) contained on the central shaft(33) limit the movement of the shaft(33) into the recess(35(c)(i.e. limit the movement into the hinge connection element)). The camera and the adjustment plate of Suso et al. would be in position 36r("rear surface") as shown in figure 3, of their respective sides of the shaft configuration, which would pass into the recess as shown in figure 5. Each side would have its own respective stopper(41).).

3. Claims 10 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suso et al.(US Patent 6,069,648) in view of Tseng et al.(US 5,815,759), in view of Kohno et al.(US Patent 5,993,101).

Consider claim 10, Suso et al. teach:

A method to operate a folding type mobile communication (figures 1a-9, column 2, line 49 through column 10, line 5) with an integrated camera("housing member", 8, figures 1a and 2, "In the housing member(8), a thin video camera, a circuit board on which a circuit for processing an output of the video camera is mounted, and the like are housed" column 2, lines 5-8), the method comprising the steps of:

aiming the integrated camera(8), which is mounted on a first lateral end(right side, figure 2) of a hinge connection element(6), towards a subject to be photographed(the camera(8) can be turned toward the subject, see figures 5a-5d for specific positions, column 4, lines 24-62), manipulating an adjustment plate(7), which is mounted on a second lateral end(left end, figure 2) of the hinge connection element(6) ("The housing member(i.e. camera), 8, is rotatably attached(i.e. the camera can be rotated in order to change the orientation) to the rotary shaft supporting part 6" column 3, lines 3-5), by providing a lateral force onto an area of the adjustment plate opposite to a desired pivot direction of the camera(because the camera(8) is attached to the adjustment plate(7) through 7a and 8a, when the adjustment plate(7) rotates, the camera(8) will rotate. Take for example figure 1c, if a lateral force was applied upward to the back side of adjustment plate(7), the adjustment plate would turn clockwise, as

would the camera(8), and the camera, which is situated on the front side would move downward(i.e. pivot in the opposite direction of the lateral force).), and manipulating at least one terminal manipulation device to photograph the subject("recording button", 19f, figure 7, The recording button starts and stops the recording of the camera, column 5, lines 31-32. The recording button is on the operation part(19) of the display(4) of the upper case(1), column 5, lines 20-32.).

However, Suso et al. do not explicitly teach that the camera has a first and a second degree of movement relative to the hinge connection element, or that at least one shaft connecting the camera and adjustment plate is axially displaced.

Tseng et al. is similar to Suso et al. in that Tseng et al. teach of an integrated camera(63, figure 6) attached to a manipulation device(62, figure 6) which is rotatably coupled to a base(61). Tseng is further similar in that the camera module(63) is rotatably coupled via a shaft(64) to the manipulation device(see figure 6, column 4, line 65 through column 5, line 24). Furthermore, Tseng et al. disclose in the prior art(figure 2, column 1, lines 32-44) an integrated camera module(21) with a single degree of rotation, similar to that taught by Suso et al.

However, in addition to the teachings of Suso et al., Tseng et al. teach that the camera(63, figure 6) has a first and a second degree of movement relative to a manipulation device(See figure 6. The camera(63) is connected to the shaft(64) via a ball joint which allows it to move about multiple degrees of freedom(column 3, lines 50-54, column 4, line 65 through column 5, line 24). Because the ball joint taught by Tseng et al. is within the camera module(63), it is possible that a ball joint can be implemented

within the camera module(8) taught by Suso et al., with the ball inside the camera module(8) and connected to the shaft(8a).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to include a ball join within the camera module taught by Suso et al. so that the camera can rotate about multiple degrees of freedom relative to the hinge connection element as taught by Tseng et al. for the benefit of expanding the operational versatility of the imaging system by making it more convenient and easier to use in working areas with limited space or where the imaging object is obscure in viewing(Tseng et al., column 1, lines 14-44).

Kohno et al. teach of a shaft coupling method(column 4, line 16, through column 6, line 21). Like Suso et al., Kohno et al. teach coupling photosensitive units(column 3, lines 48-54). Also like Suso et al., Kohno et al. teach of using a central shaft(33, figure 3), that travels within an opening(see figure 6, the central shaft(33) is inserted into the opening(35c), column 5, lines 54-56). Kohno et al. illustrate that a new coupling device is needed because current devices contain complicated coupling structures, and cannot cope with shafts whose axes are not in parallel(column 2, lines 15-26). Therefore, Kohno et al. propose a more efficient coupling structure.

In addition to the teachings of Suso et al., Kohno et al. teach a right shaft, a left shaft, an upper shaft, and a lower shaft axially disposed in the hinge connection element(see figure 3, there are four shafts(36b) axially disposed from central shaft(33));

wherein the right, left, upper and lower shafts are approximately symmetrically disposed around the central shaft(33)("four connecting pins which are arranged along the same circumference at equal pitch" column 5, lines 29-34, see figure 3);

The shaft coupling structure taught by Kohno et al., and illustrated above, would replace the shaft coupling structure taught by Suso et al., and shown in figure 2 of Suso et al. Basically, 7a and 8a of Suso et al. would be replaced by the 5-pin shaft configuration taught by Kohno et al. The combined invention of Suso et al., and Kohno et al. would then produce a device in which the central, right, left, upper and lower shafts(taught by Kohno et al.) travel through the first(Suso et al., left side of(6)) and second(Suso et al., right side of(6)) openings and are connected to the adjustment plate(7) and camera(8), respectively.

In addition to this, if a lateral force were applied to the adjustment plate taught by the combination of Suso et al. and Kohno et al., the internal shafts would become axially displaced due to the rotation of adjustment plate(7) and camera(8).

It would have been obvious to a person having ordinary skill in the art at the time of the invention to couple the adjustment plate and camera as taught by the combination of Suso et al. and Tseng et al. by using the 5-pin shaft configuration as taught by Kohno et al. for the benefit of producing a coupling device which is still simple in structure, yet capable of coping with a misalignment between the axes of the camera and adjustment plate, such misalignment as is caused by dimensional tolerances in the manufacturing stage(column 3, lines 10-18).

Consider claim 20, Suso et al. teach:

A method to operate a folding type mobile communication (figures 1a-9, column 2, line 49 through column 10, line 5) with an integrated camera("housing member", 8, figures 1a and 2, "In the housing member(8), a thin video camera, a circuit board on which a circuit for processing an output of the video camera is mounted, and the like are housed" column 2, lines 5-8), the method comprising the steps of:

aiming the integrated camera(8), which is mounted on a first lateral end(right side, figure 2) of a tubular hinge connection element(6), towards a subject to be photographed(the camera(8) can be turned toward the subject, see figures 5a-5d for specific positions, column 4, lines 24-62),

manipulating an adjustment plate(7) by providing a lateral force onto an area of the adjustment plate opposite to a desired pivot direction of the camera(because the camera(8) is attached to the adjustment plate(7) through 7a and 8a, when the adjustment plate(7) rotates, the camera(8) will rotate. Take for example figure 1c, if a lateral force was applied upward to the back side of adjustment plate(7), the adjustment plate would turn clockwise, as would the camera(8), and the camera, which is situated on the front side would move downward(i.e. pivot in the opposite direction of the lateral force).);

rotating an adjustment plate(7), which is mounted on a second lateral end(left side, see figure 2) of the tubular hinge connection element(6) and is in operational relationship with the integrated camera(8) via at least one shaft(combination of 8a and 7a) disposed through the tubular hinge connection element(6), to rotate the integrated

camera(8) so that a lens(9) of the integrated camera(8) is pointed in a desired direction("the photographing direction of the video camera housed in the housing member(8) can be therefore changed around the rotary shaft(7) as a center" column 3, lines 37-42, see figures 5a-5d); and

manipulating at least one terminal manipulation device to photograph the subject("recording button", 19f, figure 7, The recording button starts and stops the recording of the camera, column 5, lines 31-32. The recording button is on the operation part(19) of the display(4) of the upper case(1), column 5, lines 20-32.).

However, Suso et al. do not explicitly teach that the camera has a first and a second degree of movement relative to the hinge connection element, or that at least one shaft connecting the camera and adjustment plate is axially displaced.

Tseng et al. is similar to Suso et al. in that Tseng et al. teach of an integrated camera(63, figure 6) attached to a manipulation device(62, figure 6) which is rotatably coupled to a base(61). Tseng is further similar in that the camera module(63) is rotatably coupled via a shaft(64) to the manipulation device(see figure 6, column 4, line 65 through column 5, line 24). Furthermore, Tseng et al. disclose in the prior art(figure 2, column 1, lines 32-44) an integrated camera module(21) with a single degree of rotation, similar to that taught by Suso et al.

However, in addition to the teachings of Suso et al., Tseng et al. teach that the camera(63, figure 6) has a first and a second degree of movement relative to a manipulation device(See figure 6. The camera(63) is connected to the shaft(64) via a ball joint which allows it to move about multiple degrees of freedom(column 3, lines 50-

54, column 4, line 65 through column 5, line 24). Because the ball joint taught by Tseng et al. is within the camera module(63), it is possible that a ball joint can be implemented within the camera module(8) taught by Suso et al., with the ball inside the camera module(8) and connected to the shaft(8a).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to include a ball join within the camera module taught by Suso et al. so that the camera can rotate about multiple degrees of freedom relative to the hinge connection element as taught by Tseng et al. for the benefit of expanding the operational versatility of the imaging system by making it more convenient and easier to use in working areas with limited space or where the imaging object is obscure in viewing(Tseng et al., column 1, lines 14-44).

Kohno et al. teach of a shaft coupling method(column 4, line 16, through column 6, line 21). Like Suso et al., Kohno et al. teach coupling photosensitive units(column 3, lines 48-54). Also like Suso et al., Kohno et al. teach of using a central shaft(33, figure 3), that travels within an opening(see figure 6, the central shaft(33) is inserted into the opening(35c), column 5, lines 54-56). Kohno et al. illustrate that a new coupling device is needed because current devices contain complicated coupling structures, and cannot cope with shafts whose axes are not in parallel(column 2, lines 15-26). Therefore, Kohno et al. propose a more efficient coupling structure.

In addition to the teachings of Suso et al., Kohno et al. teach a right shaft, a left shaft, an upper shaft, and a lower shaft axially disposed in the hinge connection element(see figure 3, there are four shafts(36b) axially disposed from central shaft(33));

wherein the right, left, upper and lower shafts are approximately symmetrically disposed around the central shaft(33)("four connecting pins which are arranged along the same circumference at equal pitch" column 5, lines 29-34, see figure 3);

The shaft coupling structure taught by Kohno et al., and illustrated above, would replace the shaft coupling structure taught by Suso et al., and shown in figure 2 of Suso et al. Basically, 7a and 8a of Suso et al. would be replaced by the 5-pin shaft configuration taught by Kohno et al. The combined invention of Suso et al., and Kohno et al. would then produce a device in which the central, right, left, upper and lower shafts(taught by Kohno et al.) travel through the first(Suso et al., left side of(6)) and second(Suso et al., right side of(6)) openings and are connected to the adjustment plate(7) and camera(8), respectively.

In addition to this, if a lateral force were applied to the adjustment plate taught by the combination of Suso et al. and Kohno et al., the internal shafts would become axially displaced due to the rotation of adjustment plate(7) and camera(8).

It would have been obvious to a person having ordinary skill in the art at the time of the invention to couple the adjustment plate and camera as taught by the combination of Suso et al. and Tseng et al. by using the 5-pin shaft configuration as taught by Kohno et al. for the benefit of producing a coupling device which is still simple in structure, yet capable of coping with a misalignment between the axes of the camera and adjustment plate, such misalignment as is caused by dimensional tolerances in the manufacturing stage(column 3, lines 10-18).

4. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suso et al.(US Patent 6,069,648) in view of Tseng et al.(US 5,815,759) as applied to claim 11 above, further in view of Kawagoe-shi(European Patent Application Publication 1,170,517 A1).

Consider claim 12, and as applied to claim 11 above, Suso et al. teach a tubular hinge connection element, and cylindrical pivot member(see claim 12 rationale).

However, the combination of Suso et al. and Tseng et al. does not explicitly teach of at least one partially circumferential groove formed on inner surface of the tubular hinge connection element; and at least one protrusion formed on the cylindrical pivot member, wherein the at least one protrusion engages the at least one partially circumferential groove so that rotation of the cylindrical pivot member is limited within the tubular hinge connection element.

Like Suso et al., Kawagoe-shi teaches of a foldable mobile phone with a hinge element(see figure 9, paragraph 0062). Also, as taught by Suso et al., Kawagoe-shi teaches of connecting the upper and lower portions of the mobile phone with laterally opposed hinge portions which are connected together to form the complete hinge(see figure 2, paragraph 108). Kawagoe-shi also similarly teaches that a shaft(73, figure 20) is fit internally within the hinge connection element(paragraph 0109, see figure 21).

In addition to the teachings of Suso et al. and Tseng et al., Kawagoe-shi teaches at least one partially circumferential groove(figure 21, 112) formed on inner surface of the tubular hinge connection element("linking region", 120)(see figures 21);

and at least one protrusion("engagement protrusions", 73e, figure 20) formed on the cylindrical pivot member("click cam", 73), wherein the at least one protrusion(73e) engages the at least one partially circumferential groove("concave engagement grooves", 112) so that rotation of the cylindrical pivot member(73) is limited within the tubular hinge connection element(120)(see paragraph 0109).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to include at least one protrusion and at least one circumferential groove as taught by Kawagoe-shi on the cylindrical pivot member and within the tubular hinge connection element taught by Suso et al. and Tseng et al., respectively, for the benefit of being able to lock the mobile phone in different positions without greatly increasing the number of parts contained in the hinge, and preventing erroneous switch action due to phone opening freely and exposing the operation buttons(Kawagoe-shi, paragraph 0004-0006).

Consider claim 13 and as applied to claim 12 above, Suso et al. further teach:

at least one shaft(small diameter parts(7a and 8a) are rotatably fit into each other to form a shaft, column 3, lines 32-35, see figure 2) axially disposed in the hinge connection element(8) and having first(7a) and second ends(8a) connected to the adjustment plate(7) and the camera(8), respectively(see figure 2, column 3, lines 27-32).

5. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Suso et al.(US Patent 6,069,648) in view of Tseng et al.(US 5,815,759) in view of Kawagoe-shi(European Patent Application Publication 1,170,517 A1) as applied to claim 13 above, and further in view of Karube et al.(US Patent Application Publication 2001/0050711).

Consider claim 14, and as applied to claim 13 above, the combined invention of Suso et al., Tseng et al. and Kawagoe-shi teaches of first and second ends of a shaft connecting an adjustment plate and a camera(see claim 14 rationale).

The combined invention of Suso et al., Tseng et al. and Kawagoe-shi does not explicitly teach that one of the ends of the shaft is connected via a universal joint element.

Karube et al. teach of a video camera unit with a free head(figures 7-9, paragraphs 0099-0106). Like Suso et al., Karube et al. teach that the camera is connected to a body(paragraphs 0100-0103), whether that body be a PC Card, a Personal Computer, or a Personal Digital assistant, as shown in figures 7-9, respectively. The video camera unit(2), which would correspond to camera(8) of Suso et al., is connected to said bodies via a holder(3) as shown in figures 7-9.

However, in addition to the teachings of Suso et al., Tseng et al. and Kawagoe-shi, Karube et al. teaches that the camera is connected via a holder(3) that consists of a universal joint element. This universal joint element is detailed in figure 11, and in paragraphs 110-117. In the device of Suso et al., the second end(i.e. right end) of right

portion of the shaft(8a) could be connected to the camera(8) via the universal joint element taught by Karube et al. The left side of shaft(8a) would still be connected to shaft(7a) and the adjustment plate(7).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to use the universal joint element taught by Karube et al., in place of the ball joint taught by the combined invention of Suso et al., Tseng et al., and Kawagoe-shi, because the universal joint element provides the benefit of being able to adjust the viewing angle of the camera manually, and in a simple fashion with the use of one's finger, and thus being able to achieve an optimal viewing angle regardless of the original position of the camera in relation to the subject being photographed(Karube et al., paragraphs 0106 and 0117).

6. Claims 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suso et al.(US Patent 6,069,648) in view of Tseng et al.(US 5,815,759) in view of Kawagoe-shi(European Patent Application Publication 1,170,517 A1) and in view of Karube et al.(US Patent Application Publication 2001/0050711) as applied to claim 14 above, and further in view of Kohno et al.(US Patent 5,993,101).

Consider claim 15, and as applied to claim 14 above, Suso et al. teach of a shaft(small diameter parts(7a and 8a) are rotatably fit into each other to form a shaft, column 3, lines 32-35, see figure 2, see claim 14 rationale). Suso et al. also teach that the shaft is disposed approximately centrally within the hinge connection element(6)(see

figure 2, the center of the shaft formed by 7a and 8a is concentric with the center of the hinge connection element(6)). Furthermore, Suso et al. teach of first and second shaft openings through which the shaft(7a and 8a) travels(see figure 2, the hinge connection element(6) has a first opening(i.e. left side) through which left shaft portion(7a) travels, and a second opening(i.e. right side) through which right shaft portion(8a) travels.)

However, the combination of Suso et al., Tseng et al., Kawagoe-shi, and Karube et al. does not explicitly teach of a right shaft, a left shaft, an upper shaft, and a lower shaft axially disposed in the hinge connection element;

wherein the right, left, upper and lower shafts are approximately symmetrically disposed around the central shaft;

wherein the central, right, left, upper and lower shafts travel through the first and second openings and are connected to the adjustment plate and camera, respectively.

Kohno et al. teach of a shaft coupling method(column 4, line 16, through column 6, line 21). Like Suso et al., Kohno et al. teach coupling photosensitive units(column 3, lines 48-54). Also like Suso et al., Kohno et al. teaches of using a central shaft(33, figure 3), that travels within an opening(see figure 6, the central shaft(33) is inserted into the opening(35c), column 5, lines 54-56). Kohno et al. illustrate that a new coupling device is needed because current devices contain complicated coupling structures, and cannot cope with shafts whose axes are not in parallel(column 2, lines 15-26). Therefore, Kohno et al. propose a more efficient coupling structure.

In addition to the teachings of Suso et al., Tseng et al., Kawagoe-shi, and Karube et al., Kohno et al. teach a right shaft, a left shaft, an upper shaft, and a lower shaft

axially disposed in the hinge connection element(see figure 3, there are four shafts(36b) axially disposed from central shaft(33));

wherein the right, left, upper and lower shafts are approximately symmetrically disposed around the central shaft(33)("four connecting pins which are arranged along the same circumference at equal pitch" column 5, lines 29-34, see figure 3);

The shaft coupling structure taught by Kohno et al., and illustrated above, would replace the shaft coupling structure taught by Suso et al., and shown in figure 2 of Suso et al. Basically, 7a and 8a of Suso et al. would be replaced by the 5-pin shaft configuration taught by Kohno et al. The combined invention of Suso et al., Kawagoe-shi, Karube et al., and Kohno et al. would then produce a device in which the central, right, left, upper and lower shafts(taught by Kohno et al.) travel through the first(Suso et al., left side of(6)) and second(Suso et al., right side of(6)) openings and are connected to the adjustment plate(7) and camera(8), respectively.

It would have been obvious to a person having ordinary skill in the art at the time of the invention to couple the adjustment plate and camera as taught by the combination of Suso et al., Tseng et al., Kawagoe-shi, and Karube et al. by using the 5-pin shaft configuration as taught by Kohno et al. for the benefit of producing a coupling device which is still simple in structure, yet capable of coping with a misalignment between the axes of the camera and adjustment plate, such misalignment as is caused by dimensional tolerances in the manufacturing stage(column 3, lines 10-18).

Consider claim 16, and as applied to claim 15 above, Suso et al. teach of first and second openings(see claim 16 rationale). However, the combined invention of Suso et al., Kawagoe-shi, and Karube et al. does not explicitly teach that the first and second openings are cruciform in shape.

Kohno et al. teach that the first and second openings are cruciform in shape(Kohno et al., see figure 5, the recess that the 5-pin shaft shown in figure 3 is coupled to is cruciform in shape. Because both the camera and the adjustment plate would be coupled to this, both openings would have to be cruciform in shape.).

Consider claim 17, and as applied to claim 15 above, the combined invention of Suso et al., Kawagoe-shi, and Karube et al. does not explicitly teach that a first and second stoppers are disposed on the first and second ends of the central shaft, respectively, adjacent to the first and second ends of the hinge connection element.

However, Kohno et al. teaches a first and second stoppers("a C-ring which functions as a stopper", 41, figure 4, column 5, lines 39-42) are disposed on the first and second ends(i.e. left and right ends) of the central shaft(33), respectively, adjacent to the first and second ends of the hinge connection element(The stoppers(41) contained on the central shaft(33) limit the movement of the shaft(33) into the recess(35(c)(i.e. limit the movement into the hinge connection element)). The camera and the adjustment plate of Suso et al. would be in position 36r("rear surface") as shown in figure 3, of their respective sides of the shaft configuration, which would pass into the recess as shown in figure 5. Each side would have its own respective stopper(41).).

Conclusion

7. The objection made by the Examiner to the claims has been withdrawn in view of Applicant's response.

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Albert H. Cutler whose telephone number is (571)-270-1460. The examiner can normally be reached on Mon-Fri (7:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ngoc-Yen Vu can be reached on (571)-272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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PRIMARY PATENT EXAMINER